

pipe of the pump B. Through the other trunnion passes a shaft that actuates the gears, I, that drives the shaft, R, and bucket wheel, E; and upon these trunnions the shaft, R, suction pipe, and excavator swing as the cutter is raised or lowered, to suit the depth at which the work is progressing."

Claims 13, 17, and 18 of the complainant's patent 355,251, found by the court below to have been infringed by the defendant, are as follows:

"(13) In combination, a dredge boat, exhausting device, telescoping suction pipe, and a rotary excavator provided with detachable cutting edges."

"(17) In combination, a dredge boat, exhausting device, telescoping suction pipe, and a swinging section of discharge pipe flexibly joined to the boat, and to an outer stationary section, to allow said boat to feed forward, and said oscillating pipe to swing on the joint connecting the oscillating and nonoscillating sections."

"(18) In combination, a dredge boat, exhausting device, telescoping suction pipe, rotary excavator, and a swinging section of discharge pipe flexibly joined to the boat, and to an outer stationary section, to allow said boat to feed forward, and said oscillating pipe to swing on the joint connecting said oscillating and nonoscillating sections."

The element here introduced that is not embraced by any claim of patent 318,859 is a telescoping suction pipe, which is thus described in the specification contained in patent 355,251:

"O is a suction pipe provided with an elbow and telescoping section or sections, O'. It is also provided with stiffening slide rods, t, t, t, that pass through suitable slides or guides at the top and bottom of the elbow, and at the lower end of each telescoping section, except the lowest, to the latter of which they are firmly secured by strong fastenings. These slide rods are large and strong, to keep the telescoping sections of pipe and the bearings of the excavator shaft in line, and insure their easy working. The joints of the telescoping sections are placed below the surface of the water, to obviate the necessity for stuffing boxes and packing. This pipe is also provided with a hollow (generally a rotary) excavator, that delivers its spoil inward through itself to said pipe. It is further provided that the chain, I, secured to the lower end of the lowest telescoping section, and passing over suitable sheaves to a hoisting device, by means of which it is raised and lowered in the process of dredging. Similar chains are attached to the lower ends of the intermediate telescoping pipes, and to some suitable point above, to prevent said intermediate pipes from dropping out of the pipes above them."

While the telescoping suction pipe was old, the record shows that the complainant was the first to combine it with the other elements of the several combinations specified in claims 13, 17, and 18 of patent 355,251. In no just or proper sense can any of the combinations described in the complainant's claims involved on this appeal be said to be mere aggregations, for the reason that the result is the product of the combination, each element affecting the action of the others, and all of them co-operating in the one result of severing by the forward and side action of the machine the material in place where it is not wanted, and depositing it in another place where it is wanted. The flexible joints of the floating discharge pipe and the vertical anchors or turntable, as the case may be, permit the movement of the machine from side to side, as well as forward, and, in combination with the other elements spec-

ified, make possible the continuous cutting and lifting of the material in place, and its continuous transportation to the desired place of deposit. No combination of elements that so operate can be regarded as a mere aggregation, for each one has a direct influence upon the action of each of the others, the result necessarily being the product of the combination itself, and not a mere aggregate of several results, each the complete product of one of the combined elements. *Hailes v. Van Wormer*, 20 Wall. 353; *Royer v. Roth*, 132 U. S. 201, 10 Sup. Ct. 58; *Reckendorfer v. Faber*, 92 U. S. 347; *Beecher Manuf'g Co. v. Atwater Manuf'g Co.*, 114 U. S. 524, 5 Sup. Ct. 1007.

The contention that the complainant limited the form of his excavator so as to avoid an interference with the defendant in the patent office is not supported by the evidence. That he amended it is true, but not for the purpose stated by the counsel for the appellant. As amended, it described the excavator as shown in the drawings of July 13, 1864, and also as shown by the model N made by the complainant in 1868; one form containing an inner chamber at the end of the suction pipe, and the other showing the chamber cut away until only enough remains to support the excavator and its shaft; both having an inward delivery, the first to be used when the spoils do not require a large percentage of water to carry them up the suction pipe, and the second when they do. The clear meaning of a claim to an excavator having inward delivery, or with inward delivery through itself, is to an excavator so constructed as to produce an inward delivery. The terms "inward delivery" have direct reference to the mechanism itself, and cannot be properly limited to the description of the action or effect of such mechanism.

The contention on the part of counsel for the appellant that no successful machine can be built and operated in accordance with the complainant's patents is not at all supported by the record, which contains abundant evidence to the effect that machines have been so built, and have ever since been operated with very great success. The fact, if fact it be, that the first machine built by the complainant (called in the record the "Davis Machine") was not successful in its operation, is unimportant. As was well said by the court in answer to a similar objection in the case of *Mergenthaler Linotype Co. v. Press Publishing Co.*, 57 Fed. 502, 506:

"It would certainly be a novel doctrine to deny to an inventor the fruits of a broad invention because the machine which first embodied it was rudimentary in character, and failed to do as good work as improved machines made subsequently. None of the great inventions could survive such a test. Ten years after the invention of Howe, the machine first made by him would hardly have satisfied the least exacting sewing woman. The Dodds and Stephenson locomotive would, only a short time after its construction, have been discarded as behind the age, even by the savages of Tasmania. The telephone of Bell is not the perfected telephone of commerce. The Morse telegraph is looked upon to-day as an interesting antique. And yet it would be an unheard of proposition to withhold from these illustrious men the credit they deserve because their machines were crude at first, and were improved afterwards."

Giving to the complainant's patents the broad and liberal construction to which we think them justly entitled, it is clear that the second machine of the defendant constitutes an infringement of the complainant's excavator with an inward delivery, and of the combination claims of the complainant's patents adjudged by the court below to have been infringed. The judgment is affirmed.

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FOUGERES et al. v. JONES et al.

(Circuit Court of Appeals, Seventh Circuit. May 3, 1897.)

No. 276.

1. PATENTS—INFRINGEMENT.

Structural characteristics of a device, which are distinguished and made essential in a patent claim, must necessarily be found in any infringing device.

2. SAME—ANTI-RATTLERS FOR THILL COUPLINGS.

The Blair patent, No. 334,842, for an anti-rattler for thill couplings, made of a plate of steel or other suitable elastic material bent upon itself, and adapted to be inserted between the ears of a jack-clip, is expressly limited to the special form of device described, and is not infringed by a device of a different form which lacks some of its parts.

Appeal from the Circuit Court of the United States for the District of Indiana.

V. H. Lockwood and Warren G. Sayre, for appellants.  
Chester Bradford, for appellees.

Before WOODS, JENKINS, and SHOWALTER, Circuit Judges.

SHOWALTER, Circuit Judge. Appellants brought suit for the infringement of letters patent 334,842, issued January 26, 1886, to one George W. Blair. The patentee says in his specification:

"The object of my invention is the production of an anti-rattler for thill couplings, made of plate steel or other suitable elastic material bent upon itself, and adapted to be inserted between the ears of the jack-clip, and having two curves or corrugations upon its face front, one of which has a bearing against the thill iron. In the accompanying drawing, forming a part of this specification, the figure is a perspective view of the anti-rattler embodying my invention. A represents a steel or other suitable elastic plate, bent forward at a, and having a return bent at a'. The outer limb, B, is formed with a rib or corrugation, b', and has a curved portion, c, between a' and b'. From b' to the end of the plate is a curve, c', adapted to fit against the back part of the thill iron, and, by pressure against the same, prevent rattling, as is well understood. To the forwardly projecting part, X, of the spring plate, is secured by rivets, or in other appropriate manner, the plate, D, which forms a T-head adapted to rest on top the ears of the jack-clip, thus preventing the spring from falling or working out in a downward direction, while the rib between the two curved portions, c, c', prevents it from working out in an upward direction. By making the sharp return curves at a', the spring is easily inserted between the end of the thill iron and axle clip. I am aware that anti-rattlers have heretofore been made of single plates of steel bent in various forms. I therefore desire to restrict my claim to the specific device herein shown and described.

What I claim is: The anti-rattler for thill couplings hereinbefore described, made of a steel or other elastic plate, with the sharp return curve, at a', the